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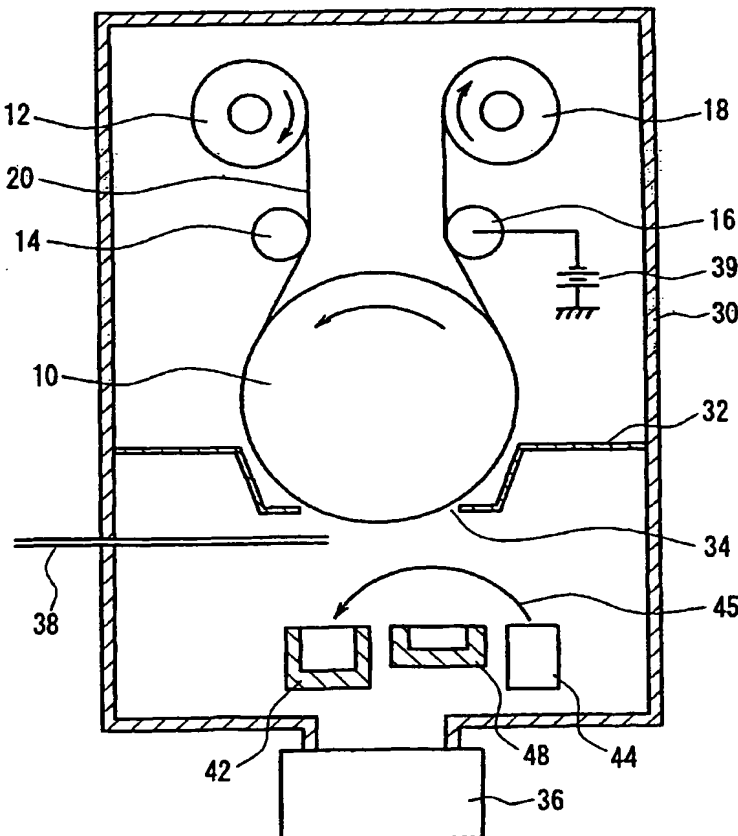
PCT

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- (51) 国際特許分類<sup>7</sup>: C23C 14/24, 14/30 (71) 出願人 (米国を除く全ての指定国について): 松下電器産業株式会社 (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.) [JP/JP]; 〒571-8501 大阪府 門真市 大字門真1006番地 Osaka (JP).
- (21) 国際出願番号: PCT/JP03/03557
- (22) 国際出願日: 2003 年 3 月 24 日 (24.03.2003) (72) 発明者; および
- (25) 国際出願の言語: 日本語 (75) 発明者/出願人 (米国についてのみ): 本田 和義 (HONDA, Kazuyoshi) [JP/JP]; 〒569-0056 大阪府 高槻市 城南町1丁目5-34 Osaka (JP). 高井 より子 (TAKAI, Yoriko) [JP/JP]; 〒560-0002 大阪府 豊中市 緑丘3丁目22-8 山口方 Osaka (JP). 岡崎 禎之 (OKAZAKI, Sadayuki) [JP/JP]; 〒576-0054 大阪府 交野市 幾野4丁目10-206 Osaka (JP). 稲葉 純一 (INABA, Junichi) [JP/JP]; 〒560-0003 大阪府 豊中市 東豊中町1丁目26-13 Osaka (JP). 伊藤 修二 (ITOH, Syuuji)
- (26) 国際公開の言語: 日本語
- (30) 優先権データ: 特願2002-86797 2002 年 3 月 26 日 (26.03.2002) JP
- [続葉有]

(54) Title: PRODUCTION METHOD AND PRODUCTION DEVICE FOR THIN FILM

(54) 発明の名称: 薄膜の製造方法及び製造装置



(57) Abstract: An electron beam evaporation source (42) for holding a first thin film material, an electron beam source (44) for emitting an electron beam (45) that heats and evaporates the first thin film material, and a resistance heating and evaporating source (48) for heating and evaporating a second thin film material by a resistance heating method are disposed so that the electron beam (45) passes through the vapor stream of the second thin film material. Accordingly, the evaporation atoms of the second thin film material can be ionized. As a result, the characteristics of thin films to be formed can be improved and their mechanical strengths increased. In addition, no additional device for ionizing the evaporation atoms of the second thin film is needed, thereby preventing configuration complication and cost increase.

(57) 要約: 第1薄膜材料を保持する電子ビーム蒸発源(42)と、第1薄膜材料を加熱し蒸発させるための電子ビーム(45)を放出する電子ビーム源(44)と、第2薄膜材料を抵抗加熱法により加熱し蒸発させるための抵抗加熱蒸発源(48)とが、第2薄膜材料の蒸気流中に電子ビーム(45)が通過するように配置される。これにより、第2薄膜材料の蒸発原子をイオン化することができる。その結果、形成される薄膜の特性を改善でき、その機械的強度を向上させることができる。また、第2薄膜材料の蒸発原子をイオン化するための新たな装置を必要としないので、構成が

複雑化したり、コストが上昇したりすることがない。

WO 03/080890 A1

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/03557

## A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl.<sup>7</sup> C23C14/24, 14/30

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl.<sup>7</sup> C23C14/00-14/58

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1926-1996	Toroku Jitsuyo Shinan Koho	1994-2003
Kokai Jitsuyo Shinan Koho	1971-2003	Jitsuyo Shinan Toroku Koho	1996-2003

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI/L [IC=C23C-014/30 and C23C-014/26]

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2001-250681 A (TDK Corp.), 14 September, 2001 (14.09.01), Claim 5; Par. Nos. [0020], [0033]; Fig. 1 (Family: none)	1-9
Y	JP 62-253762 A (Mitsubishi Heavy Industries, Ltd.), 05 November, 1987 (05.11.87), Claims; examples; Fig. 1 (Family: none)	1-9
Y	JP 6-122969 A (Mitsubishi Shindoh Co., Ltd.), 06 May, 1994 (06.05.94), Claims; Par. Nos. [0008], [0009], [0034]; Figs. 1, 2 (Family: none)	1-9

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  
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29 July, 2003 (29.07.03)

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